

8. WATER RESOURCES

INTRODUCTION

The primary focus of this chapter is *fresh* water lakes, wetlands and streams. The Penobscot River Estuary is addressed in the Marine Resources chapter. Both municipal water supply and waste water disposal are discussed in the Public Services and Facilities chapter. Freshwater is vital not only as a source for local drinking water, but also as an essential and pervasive element of a healthy natural environment. Protection of freshwater resources is important in maintaining quality of life for town residents, supporting tourism, and sustaining wildlife, vegetation, aquatic organisms, and natural productivity in near-shore marine waters.

State Goal: To protect the quality and manage the quantity of the State's water resources, including lakes, aquifers, great ponds, estuaries, rivers, and coastal areas.

OVERVIEW / MILL CLOSURE EFFECTS

Bucksport is blessed with nine major fresh water lakes & ponds, the Narramissic River and numerous streams & wetlands. State mandated Shoreland Zoning has provided some protection for these since the 1970's. Overall, municipal ordinances provide adequate protection to the town's water resources. The lake watershed phosphorus control standards are based on 1992 guidelines and need to be updated.



It is important to monitor conditions in all lakes, with a particular focus on Silver Lake, which is the source for the domestic water system serving the village area as well as the industrial fresh water needs of the mill site. With the cessation of paper making, the remaining major industrial fresh water need is the replacement cooling water for the power plant. However, the mill site owners still control far-reaching water rights to Silver Lake and the extended water shed from Alamoosook Lake via a steel pipe aqueduct and could draw upon that entire resource once again should the need arise.

HIGHLIGHTS

- ★ The paper mill used up to 18 million gallons of fresh water every day from Silver Lake.
- ★ The Silver Lake watershed seems to support current usage, but could be over-taxed.
- ★ The aqueduct requires regular maintenance by the mill site owners to remain operable.
- ★ The extended SL watershed is more than 30 times larger than the natural watershed.
- ★ With less flushing, Maine Water has agreed to do more testing of its SL source water.
- ★ Steps have begun toward forming a lake association to help monitor Silver Lake.
- ★ Water company representatives have stated that limited swimming in Silver Lake would not harm the drinking water quality since sufficient processing is already being done.

ANALYSIS

Wastewater Discharges. There are three licensed discharges of waste water in Bucksport. These are the sewage treatment plant and two discharges from the mill site.

Are there point sources (direct discharges) of pollution in the community? If so, is the community taking steps to eliminate them?

DEP records indicate that there are no licensed overboard discharges (wastewater from individual disposal systems that discharge into a water body) in Bucksport. While no firm data are available, the code enforcement officer has reported cases of homes with older, malfunctioning septic systems that need to be replaced. The status of the discharge from the sewage treatment plant is discussed further in the Public Facilities and Services. As of 2014, the discharge included a Combined Stormwater Overflow (CSO). It operates under a state permit that is effective until 2017. The Verso Mill had a processed water discharge of 18 MGD (million gallons per day). There is also a 72 MGD discharge of cooling water that is drawn from the river. DEP records indicate that these discharges have no adverse impact on the water quality standards established for this segment of the Penobscot River. For discussion on the impacts of these discharges on marine life, see the Marine Resources chapter.

Non-point Pollution. The primary non-point source of pollution is stormwater run-off from the areas of impervious surface or areas where there has been extensive removal of vegetation. The land use ordinance has provisions regulating stormwater run-off. These include standards for manure storage and spreading, driveway drainage, and parking lots. The standards do not reflect the latest guidelines for low impact development, which offer more detailed options for on-site management of stormwater.

Are there non-point sources of pollution? If so, is the community taking steps to eliminate them?

The subdivision ordinance has provisions to manage phosphorus runoff into lakes. It sets the maximum phosphorus export per acre of developed land for each great pond watershed in town. The ordinance requires that phosphorus control measures meet the design criteria cited in the DEP manual ***Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development***, September 1992 version. The 1992 standards are now out of date and newer guidelines are available.

Water Supply Protection. The Bucksport zoning ordinance prohibits storage or use of hazardous materials within 250 feet of the boundaries of an aquifer. There is not an aquifer overlay district. There is a requirement that no land use may reduce the quality of drinking water sources to below the minimum requirements Maine State Drinking Water Regulations. If existing water quality on a site is nonconforming, no proposed development may increase the nonconformity. The ordinance prohibits any land use activity that would substantially lower the water table or detrimentally affect the quantity of subsurface water available to wells not under the control of the property owner. It also forbids the discharge of any materials that may contaminate, pollute or harm such ground or surface waters. These include floating or

How are groundwater and surface water supplies and their recharge areas protected?

submerged debris, oil or scum, discoloring, objectionable odor or taste, or that may be harmful to human, animal, plant or aquatic life.

The subdivision ordinance has standards to protect groundwater resources. These include provisions to protect individual wells from contamination and to assure adequate supply during drought conditions. The planning board has the authority to hire a hydro-geologist to assess groundwater conditions.

The town does not have a source water protection ordinance. This ordinance would protect public drinking water supplies by restricting land uses in the area surrounding a drinking water well or surface water source.

As mentioned elsewhere in this Plan, the mill site owners control extensive water rights to and from Silver Lake. The Town may want to clarify its rights to future water supply and to maintain lake levels. The shorefront of Silver Lake, the source of the municipal water supply is zoned Resource Protection. Surface water is also protected by stormwater management standards.

There is a town ordinance prohibiting swimming in Silver Lake but there is the risk of unauthorized recreational use. Water company representatives have stated that limited swimming in Silver Lake would not harm the drinking water quality since sufficient processing is already being done. Any change to that ordinance would require a decision by the Town Council. The roadway along the southwest shore of the lake is a potential source of contamination due to stormwater runoff and accidental spills from vehicular traffic. As discussed below, the lake is connected by aqueduct to lakes outside the town boundaries.



In order to protect Bucksport's water resources, all of its Public Works projects and annual maintenance of roadways comply with the best management practices and other requirements of both MDOT and MDEP.

As is discussed below, Bucksport shares some of its great pond watersheds with other towns. This encourages regional collaboration through lake associations.

Verso Paper Corp. Lake Level Management Plan



Original Version 5/2/97
Revised 9/07, 4/11, 12/11, 8/14, 12/14, 8/15

The Alamoosook Lake Association website hosts a copy of the paper mill's Lake Level Management Plan at: <http://www.alamoosooklakeassociation.com>

Do public works crews and contractors use best management practices to protect water resources in their daily operations (e.g. salt/sand pile maintenance, culvert replacement street sweeping, public works garage operations)?

Are there opportunities to partner with local or regional advocacy groups that promote water resource protection?

CONDITIONS AND TRENDS

Great Ponds

There are nine great ponds (defined as a freshwater pond at least ten acres in size, 30 acres if man-made) in Bucksport. They are summarized in Tables 8.1 and 8.2. Five of these ponds share their drainage area with adjoining towns. This means that activities outside of town boundaries can affect water quality in the lakes.

While the Silver Lake drainage area lies entirely within Bucksport, it is connected by aqueduct to Philips Lake, Toddy Pond, and Alamoosook Lake. It supplies water to the mill site and the municipal water system. AIM presently uses less than 2 million gallons of water per day (gpd). The municipal system uses an average of 256,000 gpd. Representatives from Maine Water believe that the natural watershed of Silver Lake can support this current level of usage. When in full swing, however, the paper mill would consume up to 18 million gpd. This would require the operation of the aqueduct and pumps to avoid exhausting Silver Lake to water levels akin to its original, much smaller form.



The 36" pipeline near Alamoosook Lake has needed some work over the years.

Table 8.1 Characteristics of Major Ponds and Lakes in Bucksport					
Below: links to lakesofmaine.org	Direct Drainage Area (DDA)	% DDA in Bucksport	Lake Status Quality	Invasive Species	Other Towns in Watershed
Brewer Lake	4,028 acres	28%	Average	None known	Holden & Orrington
Hancock Pond	806 acres	100%	Below average	None known	None
Jacob Buck Pd	1,468 acres	87%	Above Average	None known	Orrington
Long Pond	1,013 acres	100%	Average	None known	None
Moulton Pond	306 acres	55%	Not available	None known	Dedham
Mud Pond	1,013 acres	100%	Not available	None known	None
Silver Lake	2,562 acres	100%	Average	None known	None
Thurston Pond	1,245 acres	72%	Average	None known	Orrington
Williams Pond	1,124 acres	68%	Below average	None known	Orrington
Source: Maine DEP, Lakes Division, updated in 2013					

According to DEP records, Silver Lake has average water quality. Since it is a drinking water source, it must be monitored for any potential threats that would affect water quality. Maine Water has agreed to do more testing of the source water since the flushing rate is likely to remain much lower than when the mill was fully functioning.

Maine DEP data indicate that there are no records of invasive aquatic species in any pond in town. Water quality data indicate that Jacob Buck Pond is the only pond with above average water quality. Williams and Hancock Ponds are below average in water quality. The major threat to lake water quality comes from development in the watersheds.

DEP records show that Silver Lake, Jacob Buck Pond, and Long Pond are “at risk from new development.” This does not mean that the ponds face imminent threats. Rather, they need to be monitored since they are public water supplies (in the case of Silver Lake) or could be adversely affected by poorly planned future development in their watersheds. Developments subject to a DEP Stormwater or Site Location of Development permit are required to meet additional review standards in “at risk” lakes. (See the stormwater review standards in Section 12.3.8 of the land use ordinance).



Sign at Silver Lake boat launch site.

Water quality monitoring data for Silver Lake have been collected since 1976. Five years of basic chemical information was collected in addition to Secchi Disk Transparencies (SDT). The water quality of Silver Lake is considered to be average, based on measures of SDT, total phosphorus (TP) and Chlorophyll-a (Chla). The potential for nuisance algal blooms on Silver Lake is moderate.

Water quality data for Jacob Buck Pond have been collected since 1980. Five years of basic chemical information was collected in addition to SDT. The water quality of Jacob Buck Pond is considered above average based on measures of SDT, TP, and (Chla). The potential for nuisance algal blooms on Jacob Buck Pond is low.

Water quality data for Long Pond have been collected since 1979. During this period, 4 years of basic chemical information was collected, in addition to SDT. Based on measures of SDT, TP, and Chla., Long Pond is ranked as average in water quality. Its potential for nuisance alga blooms is moderate. For more information on water quality for these and the other ponds in Bucksport, see www.lakesofmaine.org.



Vernal pools are seasonal fresh water ponds discussed in the Natural Resources Chapter.

Table 8.2 Additional Data on Lakes in Bucksport				
Name	Total Size*	Perimeter	Mean depth	Max. depth
Brewer Lake	958 acres	9 miles	26 feet	48 feet
Hancock Pond	62 acres	1.5 miles	17 feet	25 feet
Jacob Buck Pond	182 acres	2.8 miles	22 feet	52 feet
Long Pond	160 acres	3.5 miles	18 feet	29 feet
Moulton Pond	49 acres	1.3 miles	23 feet	35 feet
Mud Pond	35 acres	1.4 miles	---	---
Silver Lake	682 acres	14.4 miles	---	33 feet
Thurston Pond	129 acres	2.8 miles	11 feet	25 feet
Williams Pond	79 acres	1.9 miles	24 feet	50 feet
SOURCE: Lakes Division, Maine DEP *Size regardless of town boundaries				

Streams and Rivers

Bucksport borders on two rivers and contains many streams of varying sizes. The largest by far is the Penobscot River, which is actually an estuary in the vicinity of Bucksport due to the mix of fresh water current from the north and salt water tides from the south.

The lower Penobscot River has several impairments. The level of dioxins, mercury and PCB's in fish exceeds safe consumption limits. The state fish consumption advisories recommend eating no more than two fish meals a month from the river below Lincoln. These contaminants appear largely to be from sources beyond the control of the town. Other fishing restrictions are discussed in the Marine Resources chapter. According to the DEP, the Silver Lake outlet to the Penobscot River (Mill Stream) has impaired water quality. This is due to water withdrawals rather than to pollution.



The northwest shore of the Narramissic River is in Bucksport from Duck Cove to below Alamoosook Lake. It is accessible by canoe from Orland at either end.

The Narramissic River is a navigable waterway on Bucksport's eastern boundary. Along with its large adjacent wetlands is home to much wildlife that may be enjoyed from boat launch sites in Orland. The town of Orland is considering whether or not to continue with maintenance of the dam since it was given to the town by the former mill owners.

Other navigable streams include Wights Brook, Moosehorn Stream and Mill Stream above Long Pond. Public access points are discussed in the Recreation Chapter. Bucksport's larger streams are shielded from development by a 75-foot Stream Protection Overlay buffer strip that is described in the Shoreland Zoning Ordinance.

Groundwater Resources

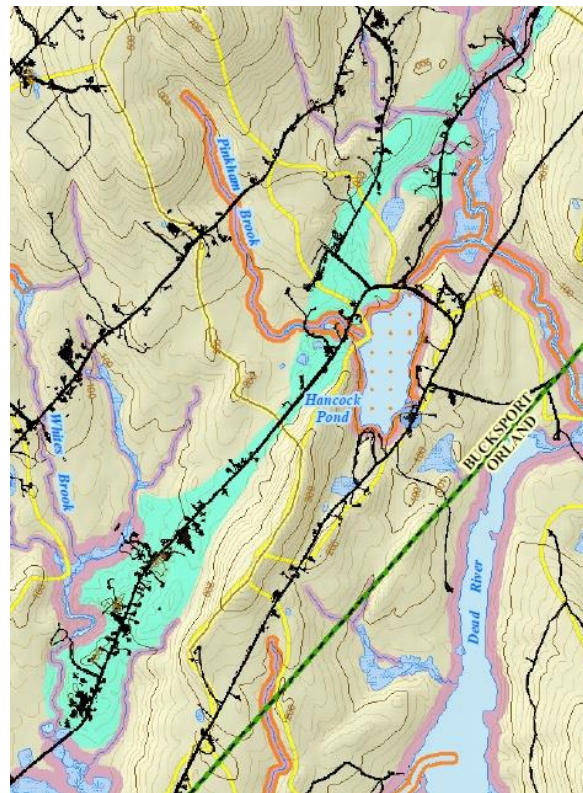
Sand and gravel aquifers in Maine were deposited by glacial melt-water streams thousands of years ago. Wells, which are properly constructed in these aquifers, have the capacity to yield large volumes of water. The Maine Geological Survey has identified four sand and gravel aquifers in Bucksport, all of which have yields in the range of 10 to 50 gallons per minute. One is located on the town boundary with Orland at Duck Cove. A second is located on the northwest side of Route 46 at White's Brook. A third is located at Long Pond, and the fourth is located on the north side of Jacob Buck Pond. As mentioned Section D.3 above, the town has standards to protect aquifers from most potential sources of contamination.

Public Water Systems

Public water systems are defined as those that serve a given number of the general public even if they are not publicly owned. They may be as large as a system serving a downtown area or as small as one serving a restaurant. These systems are subject to various state regulations and reporting requirements. According to data from the Maine Drinking Water Program, there are four public water systems in Bucksport. The system serving the downtown is discussed in the Public Services and Facilities chapter.

The map shows the “public water supply source water protection area.” This area is defined as the “area that contributes recharge water to a surface water intake or public water supply well.” Operators of these systems, per state law, must be notified of land use decisions that could affect the source water protection area. This allows the operators to participate in the municipal decision making process and helps reduce the risk of contamination to public water supplies.

It is important to monitor development around the wells that serve these various systems. Particular attention should be paid to those wells with high risk factors for future contamination (see Table 8.3). The Harriman Cove Mobile Home Park system has a high risk factor and deserves careful monitoring. The risk ranking means there is the potential for contamination. It does not necessarily mean that contamination has occurred. Factors contributing to the risk include a septic system and an above-ground oil storage tank within 300 feet of the well. The well owner does not control the land within the source water protection area.



Bucksport's sand & gravel aquifers and other water resources are shown on Beginning with Habitat Map 1 and may be seen at www.bucksportmaine.gov.

Table 8.3 Public Water Systems, Bucksport*		
State ID #	System Name/Owner	Risk of Acute Contamination
ME0002243	Bucksport Golf Club	Low
ME0002245	Harriman Cove Mobile Home Park	High
ME0015106	Sherwood Forest Mobile Home Park	Moderate
*NOTE: the municipal system is discussed in the Public Facilities and Services chapter.		
SOURCE: Maine Drinking Water Program, 2013		

Bucksport's public water supply wells and protection zones are shown on Beginning with Habitat Map 1 and may be seen at www.bucksportmaine.gov.